Defense Information Systems Agency

A Combat Support Agency

Enterprise Computing

16 August 2011

Topics

- **Enterprise Services**
  - Email, SharePoint, PaaS, GCDS
- **Technology Focus**
  - Virtualization, Storage,
  - DECC Comm, Z-Linux
- **Major Customer Initiatives**
- **Future Computing Strategy**

Full Range of Military Operations
Operate and Assure
Contested Battle Space
C2 / Information Sharing
Coalition and Non-Government
Enterprise Infrastructure
Seamless IP/Transport/Computing
Line of Operation 3
Line of Operation 2
Line of Operation 1

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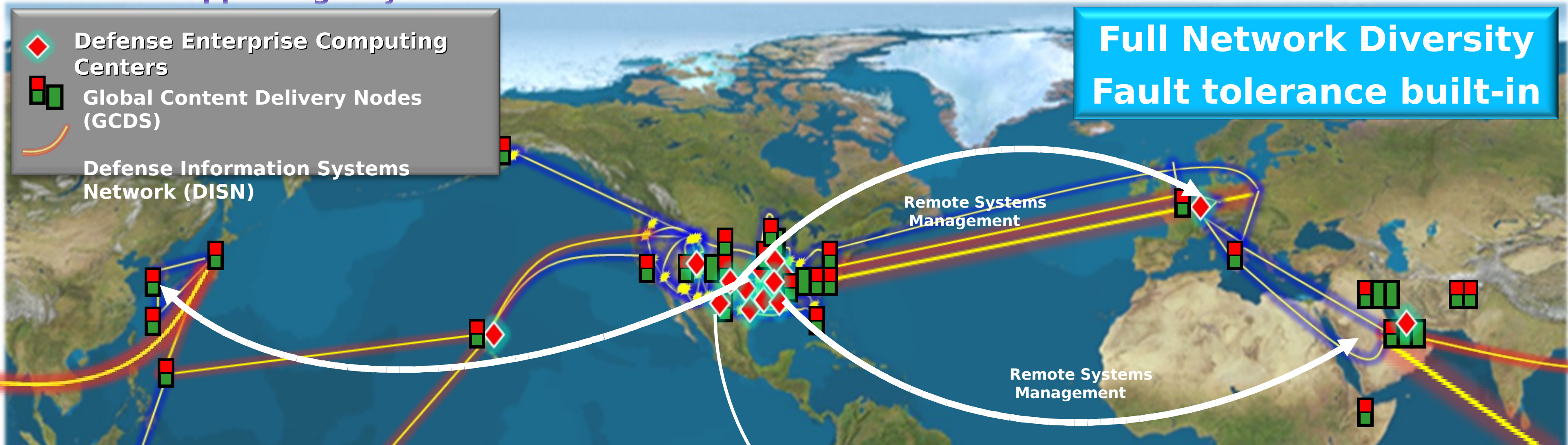
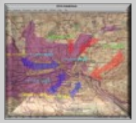
DISA Computing Today

- 🟥 Defense Enterprise Computing Centers
- 🟥🟩 Global Content Delivery Nodes (GCDS)
- Defense Information Systems Network (DISN)



Full Network Diversity
Fault tolerance built-in

Critical Application Hosting


Command/Control

Warfighter Logistics

Medical, Pay, Personnel

- Air Force/Marine Corps/Army Global Combat Support System (GCSS)
- Missile Defense Battle Management (C2BMC)
- TRANSCOM Global Transportation Network (GTN)
- Defense Connect Online (DCO)
- Coalition Applications (CENTRIXS ISAF)
- Defense Distribution Standard System (DSS)
- Air Force and Army Combat requisition, resupply, maintenance and mobility systems
- Air Force Transportation and cargo movement systems
- Army/Air Fore/Navy Medical Systems (ie. Composite Health Care System (AHLTA), TriCare Online)
- All Military and Civilian Pay and Personnel Systems
- Electronic business and contracting systems

14 facilities

4,000,000+ users

34 mainframes

8000+ Operating Environments

9 Petabytes of storage

Redundant Network Connectivity

Net Defense Built In

Computing and Services power from the Edge back

Enterprise Services

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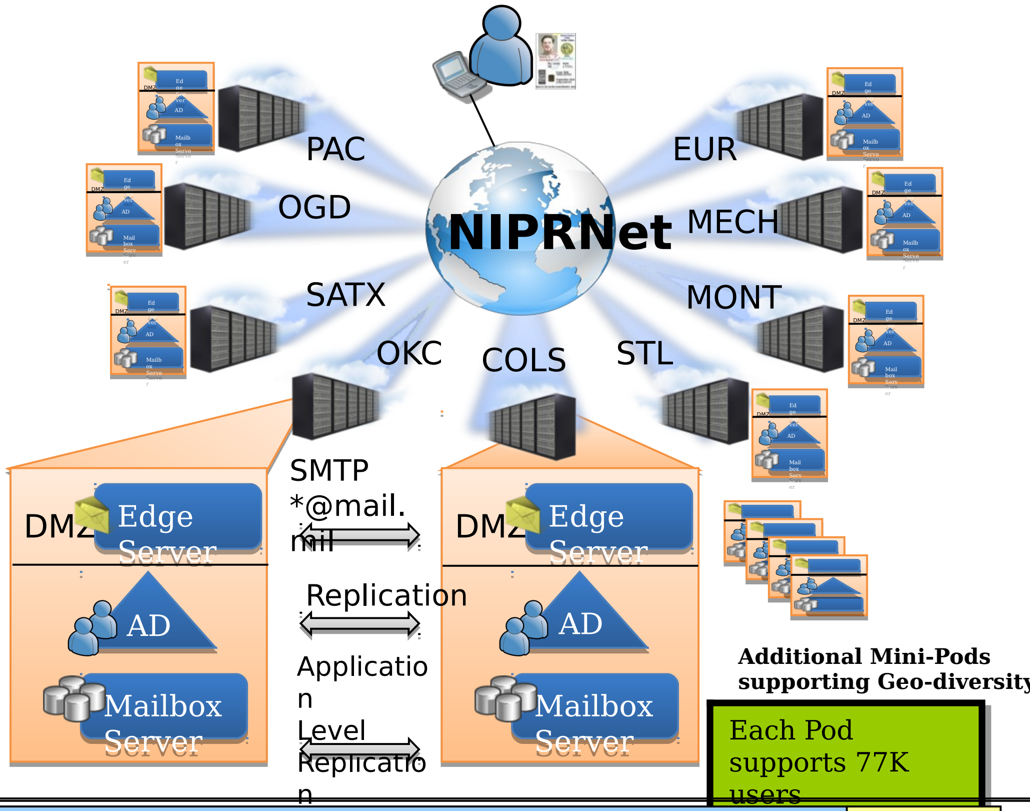
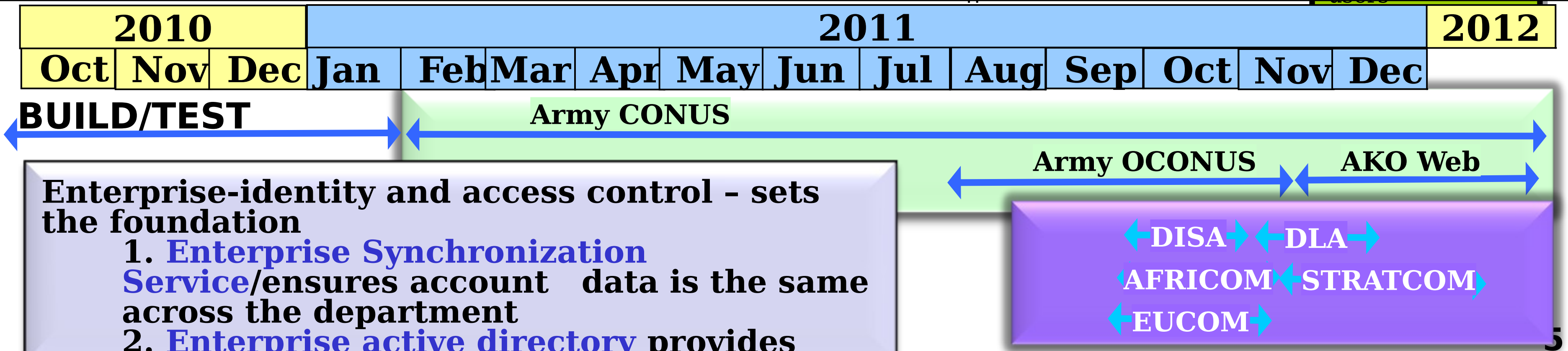
DoD Enterprise Email

- **DoD Enterprise Focus**
  - Enterprise Data & Scaling
  - US Army first
- **DISA Managed Service**
- DISA DECC Hosted
- Fully Redundant; Highly Available
- Globally Distributed
- 24 X 7 Operations
- **NIPRNet first, then SIPRNet**

Classes of Service

- Outlook Web Access (all users)
- Outlook (business class users)
- Blackberry Service (select users)


NIPRNet
PAC
OGD
SATX
OKC
COLS
STL
EUR
MECH
MONT
DMZ
Edge Server
AD
Mailbox Server
SMTP *@mail.mil
Replication
Application Level Replication
DMZ
Edge Server
AD
Mailbox Server
Additional Mini-Pods supporting Geo-diversity
Each Pod supports 77K users



Enterprise-identity and access control – sets the foundation

1. **Enterprise Synchronization Service/ensures account data is the same across the department**
2. **Enterprise active directory provides access control and GAL for enterprise apps**

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Enterprise SharePoint Service

- **Enterprise SharePoint Service (ESPS) – two platforms based on the two SharePoint client access licenses (CAL) with NIPRNet & SIPRNet**
  - **Standard Platform (customer provides standard CAL for users)**
    - **Basic SharePoint features such as document libraries, team sites, task lists, wikis, blogs, & basic work flows**
  - **Enterprise Platform (customer provides enterprise CAL for users)**
    - **Standard features plus FAST search, Office Web Applications, performance indicators, reporting tools, and 3rd party software tools for more advanced workflow and reporting**

- **SP site collections, globally accessible by one of two CONUS SP instances, at Oklahoma City or Mechanicsburg (which COOP for one another)**
- **Users may access either SP instance from the NIPRNet**
- **Users authenticate via TLS session directly to SP instances using CAC**
- **DISA provides Tier III/IV support (DECC and CSD PMO)**
- **The GISMC will be the Tier II service desk, Tier I service is customer provided**

Global Content Delivery Service

74 Multi-Service Applications LIVE!

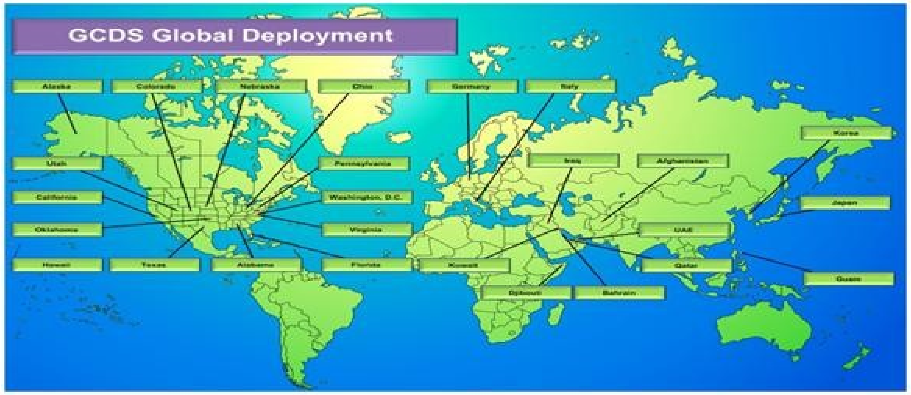
Successes

- Saves Millions in IT Expansion Costs for DoD
- Accelerates Collaborative Applications to Warfighters
- Adjusts Quickly to Changes in Network Conditions
- Excellent Customer Feedback

Additional Services

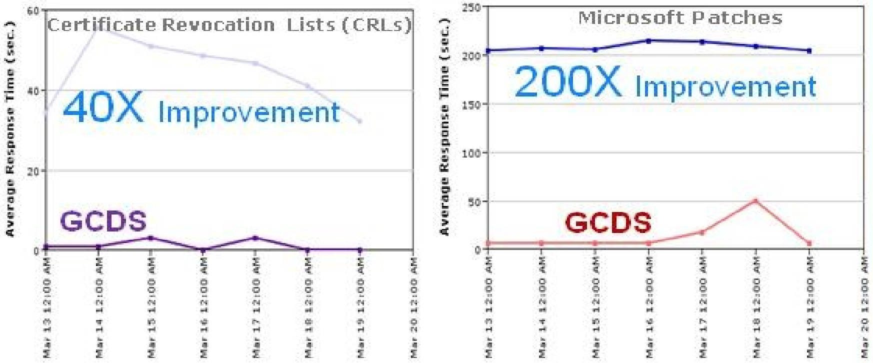
- NetStorage
- HD Streaming
- ISAF-CXI (*coming soon*)
- DISN Subscription Service

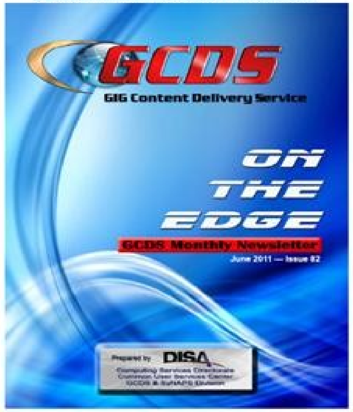
53 Regions 13 States 11 Countries


GCDS Global Deployment
Alaska
Colorado
Nebraska
Ohio
Germany
Italy
Korea
Utah
Pennsylvania
Iraq
Afghanistan
California
Washington, D.C.
Japan
Oklahoma
Virginia
UAE
Hawaii
Texas
Alabama
Florida
Kuwait
Qatar
Guam
Djibouti
Bahrain

http://www.disa.mil/gcds

GCDS Performance from Kandahar




GCDS
GIG Content Delivery Service
ON THE EDGE
GCDS Monthly Newsletter
June 2011 — Issue 02
Prepared by DISA

GCDS 1.0
HTTP/S Delivery

GCDS 1.x
Gig Edge Capacity
Full Edge Deployment

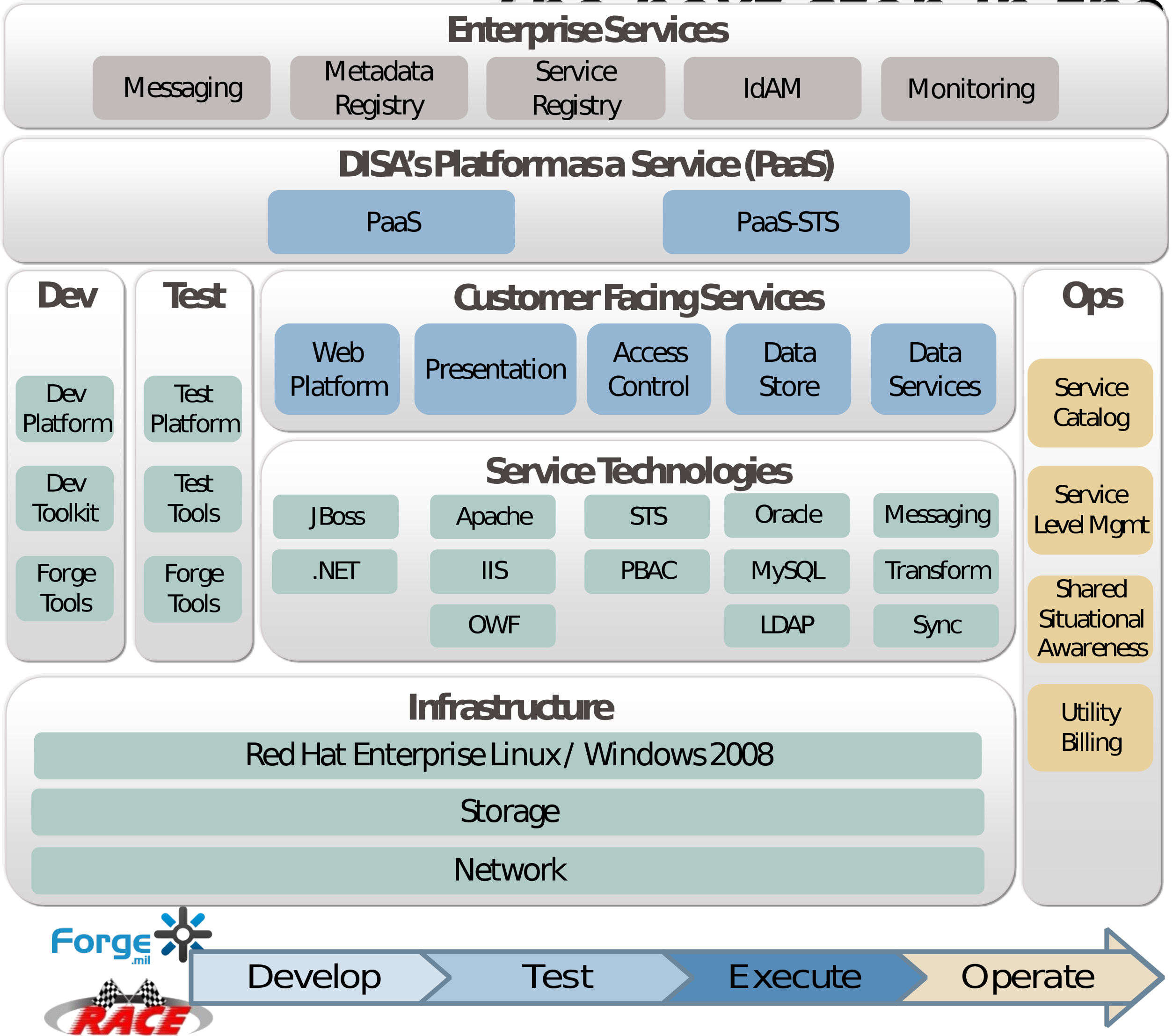
GCDS 2.0
Network Storage
Global Traffic Mgmt
Global Views
Today

GCDS 3.0
Flash Streaming
Enterprise Service Node Patch
In Progress

GCDS 4.0
MAC 1
Tier 1 Enterprise Recursive Service
Edge Computing
Coming Soon

Platform as a Service (PaaS)

The next step in the Cloud evolution



Enterprise Services

Messaging | Metadata Registry | Service Registry | IdAM | Monitoring

DISA's Platform as a Service (PaaS)

PaaS | PaaS-STS

Dev

- Dev Platform
- Dev Toolkit
- Forge Tools

Test

- Test Platform
- Test Tools
- Forge Tools

Customer Facing Services

Web Platform | Presentation | Access Control | Data Store | Data Services

Service Technologies

JBoss | Apache | STS | Oracle | Messaging

.NET | IIS | PBAC | MySQL | Transform

OWF | LDAP | Sync

Ops

- Service Catalog
- Service Level Mgmt
- Shared Situational Awareness
- Utility Billing

Infrastructure

Red Hat Enterprise Linux / Windows 2008

Storage

Network

Features

- Standards-based web platform
- Common, central access control
- Data services
- Continuity of Operations
- Shared situational awareness

Characteristics

- Self-service from catalog
- Utility billing
- Distributed, Elastic, and Scalable
- Multi-tenant
- Rapid path to production
- Pre-integrated Enterprise Services
- Metered
- Development lifecycle management
- Conforms to DOD security standards

Technology Focus

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Virtualization

Sizing for the eventual, not for today

- Planned growth does not always match actual usage
- VOE resources can usually be augmented without down time

Building physical solutions and transposing them onto VOEs

- Virtual servers are immune to protracted outages due to hardware failure

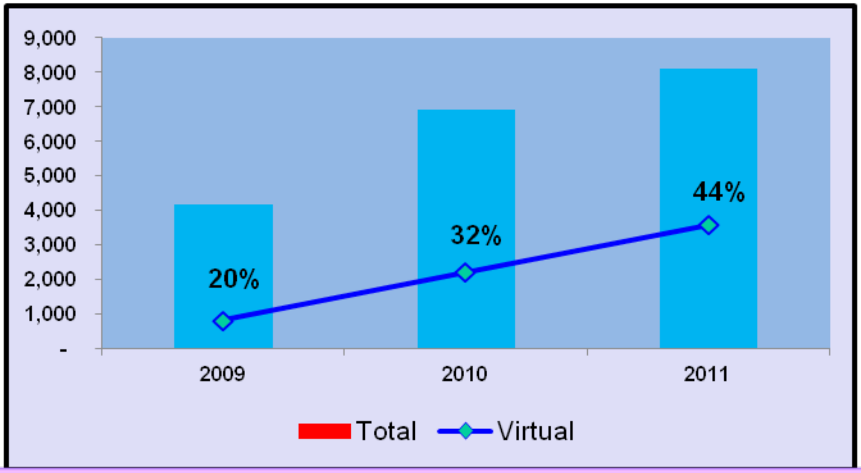
Calling virtualization the problem

- Spending numerous man-hours on “virtualization” issue
- Root causes typically track back to application configurations

Host Refresh:
Replacing first generation hosts at a 1:4 new to old ratio with no VOE impact

Storage Refresh:
Replacing 400 TB of storage with no VOE impact

Server Virtualization Trend

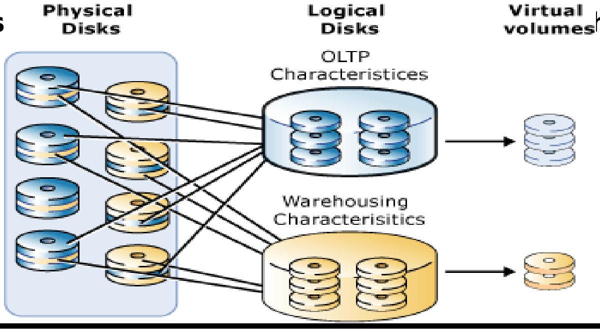


or today, grow for tomorrow – dynamic increases in capacity wit disruption to availability of production

Storage Initiatives

Virtualization

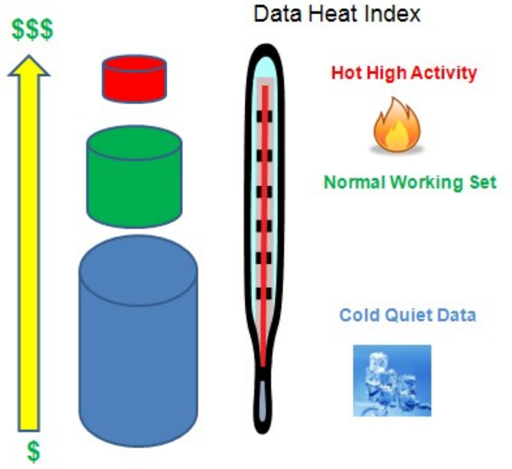
- Separates physical disk capacity from logical disk capacity
- Faster provisioning
- Keeps cos hysical disk


Physical Disks
Logical Disks
Virtual volumes
OLTP Characteristices
Warehousing Characterisitics

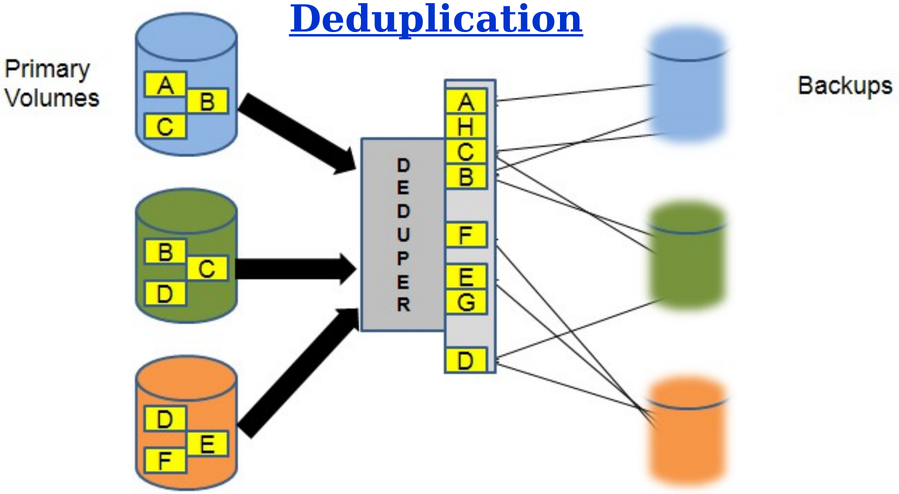
Tiered Storage

•Today –Arrays with FC, SAS,
and SATA disks. Manual positioning of data.

•Tomorrow – ***Solid state***, FC,
SAS and SATA. Automatic positioning of data based on
activity.

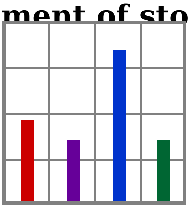

$$$
$
Data Heat Index
Hot High Activity
Normal Working Set
Cold Quiet Data

Data Deduplication


Primary Volumes
A
B
C
B
C
D
D
E
F
DEDUPER
A
H
C
B
F
E
G
D
Backups

Storage Resource Management

- Improved automate storage billing process
- Im management of storage
- cs



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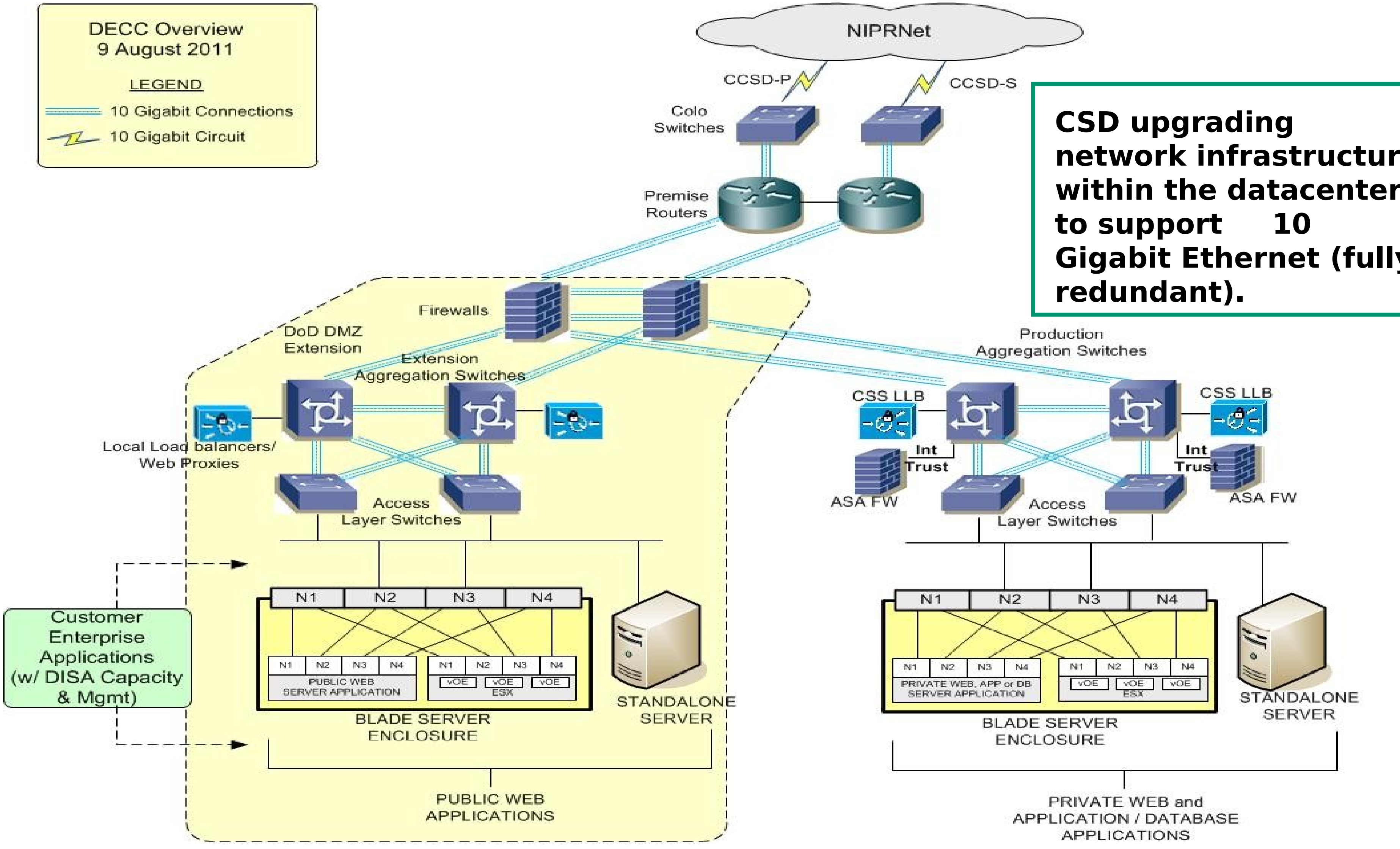
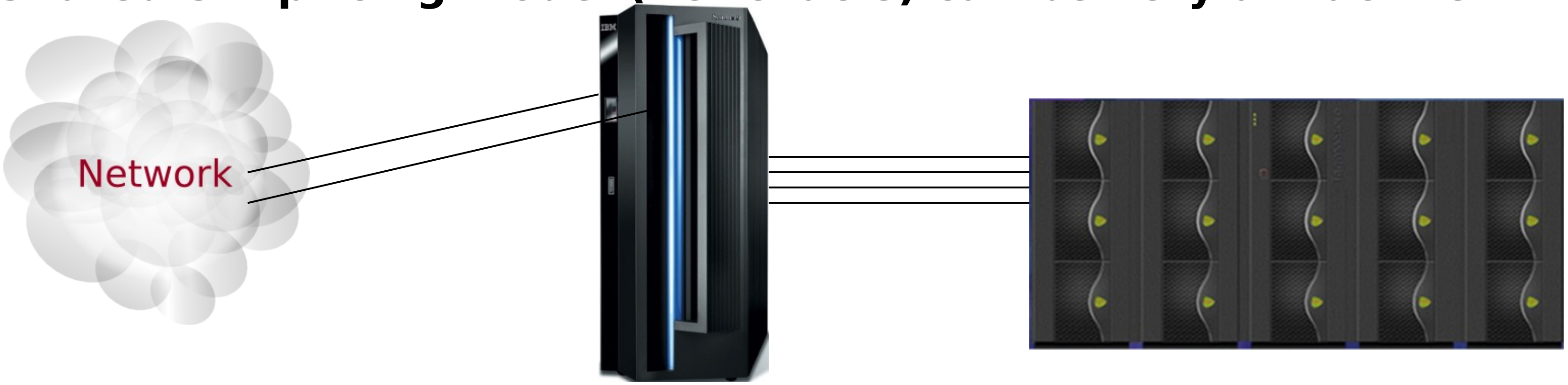
10 Gigabit Infrastructure Upgrades


DECC Overview
9 August 2011
LEGEND
10 Gigabit Connections
10 Gigabit Circuit
NIPRNet
CCSD-P
CCSD-S
Colo Switches
Premise Routers
Firewalls
DoD DMZ Extension
Extension Aggregation Switches
Local Load balancers/ Web Proxies
Access Layer Switches
Customer Enterprise Applications (w/ DISA Capacity & Mgmt)
N1
N2
N3
N4
PUBLIC WEB SERVER APPLICATION
vOE
ESX
BLADE SERVER ENCLOSURE
STANDALONE SERVER
PUBLIC WEB APPLICATIONS
Production Aggregation Switches
CSS LLB
Int Trust
ASA FW
PRIVATE WEB, APP or DB SERVER APPLICATION
PRIVATE WEB and APPLICATION / DATABASE APPLICATIONS

CSD upgrading network infrastructure within the datacenters to support 10 Gigabit Ethernet (fully redundant).

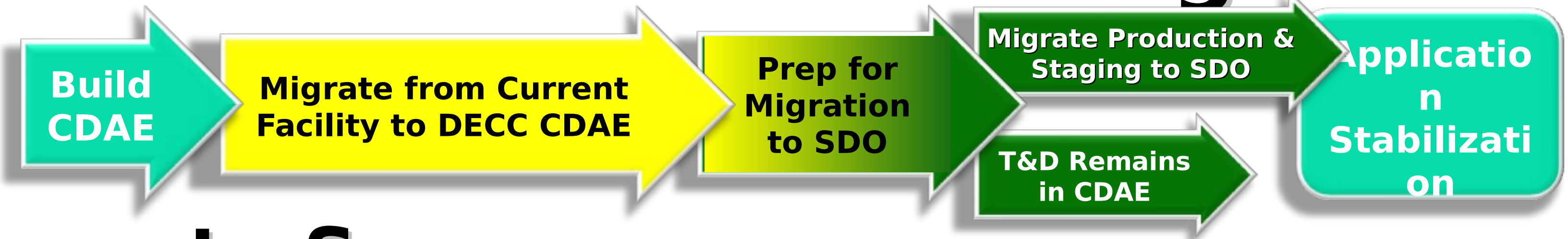
New “zLinux” Offering

- Architecture employs a ‘specialty engine’ called an Integrated Facility for Linux (IFL) and hosted on an IBM System z Server
  - 8 Gbps connection to SAN & 2 Gbps connection to network
  - Mainframe Reliability, Availability, and Redundancy
  - Ability to communicate at near memory speeds between guests as well as z/OS using Hypersockets to communicate/transfer data
- Consumption pricing model – attractive for seasonal or peak loads
  - FY11 rate is $31.6937 / CPU Hour
  - FY12 rate is $27.9647 / CPU Hour
- COOP is included in CPU rate (storage is additional)
- Shared SW pricing model (i.e. Oracle) can be very attractive



Major Customer Initiatives

DLA Application Migrations



Build CDAE

Migrate from Current Facility to DECC CDAE

Prep for Migration to SDO

Migrate Production & Staging to SDO

T&D Remains in CDAE

Application Stabilization

Steps to Success:

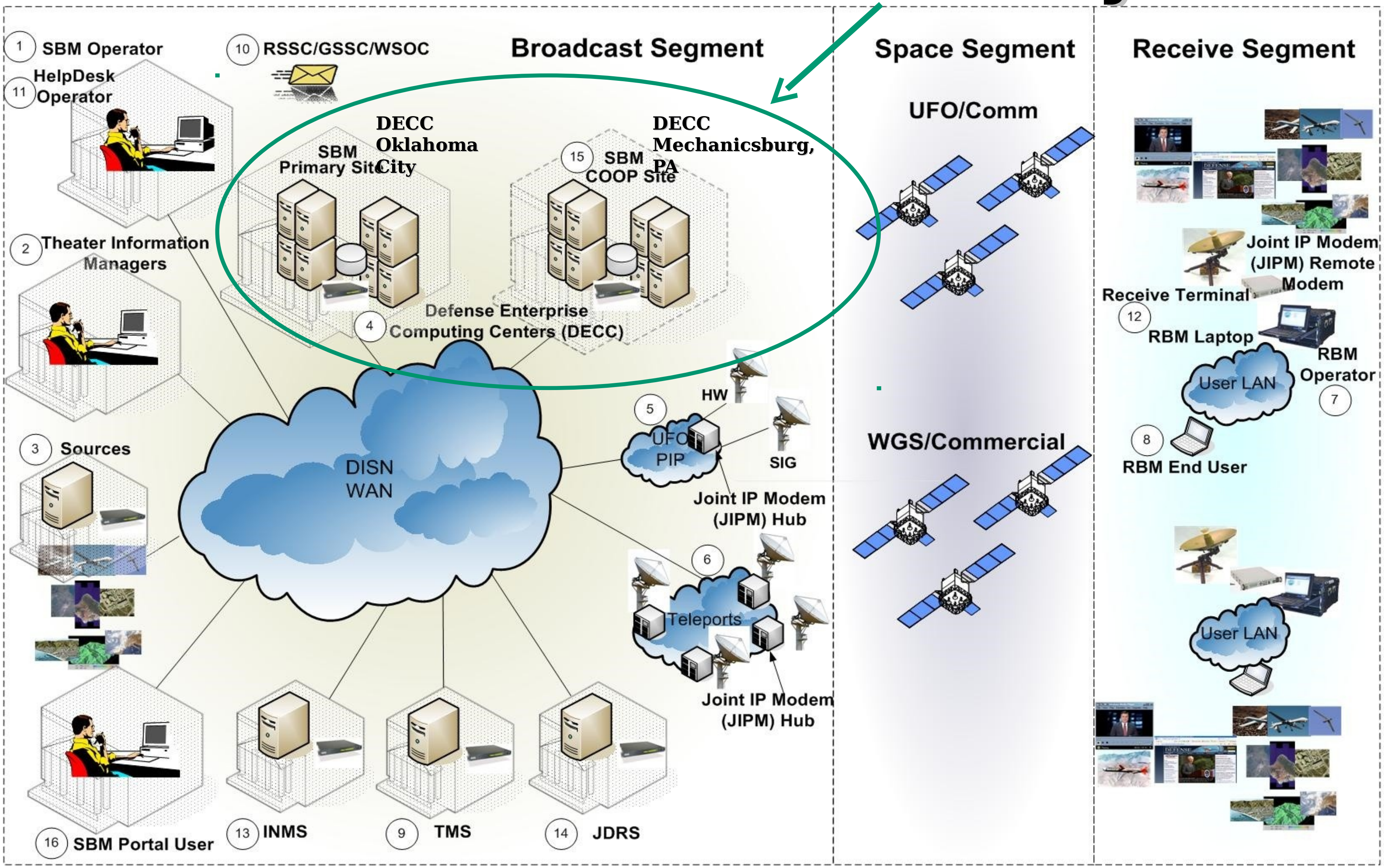
- **Customer Designated Approving Authority (DAA) Accredited Enclave (CDAE) is built in a DISA facility, on the customer's network**
- **Applications migrate into the CDAE**
- **Applications are prepared for migration into the Standard DISA Offering (SDO)**
  - **Authority to Operate (ATOs) facilitate the migration to SDO**
- **Production/Staging environments migrate to DISA network while Test/Development remain on customer's network**
- **Application Stabilization**

Migration to CDAE provided FY 12 Savings

$ 2.9 Million

Streamlined migration path to DISA CSD

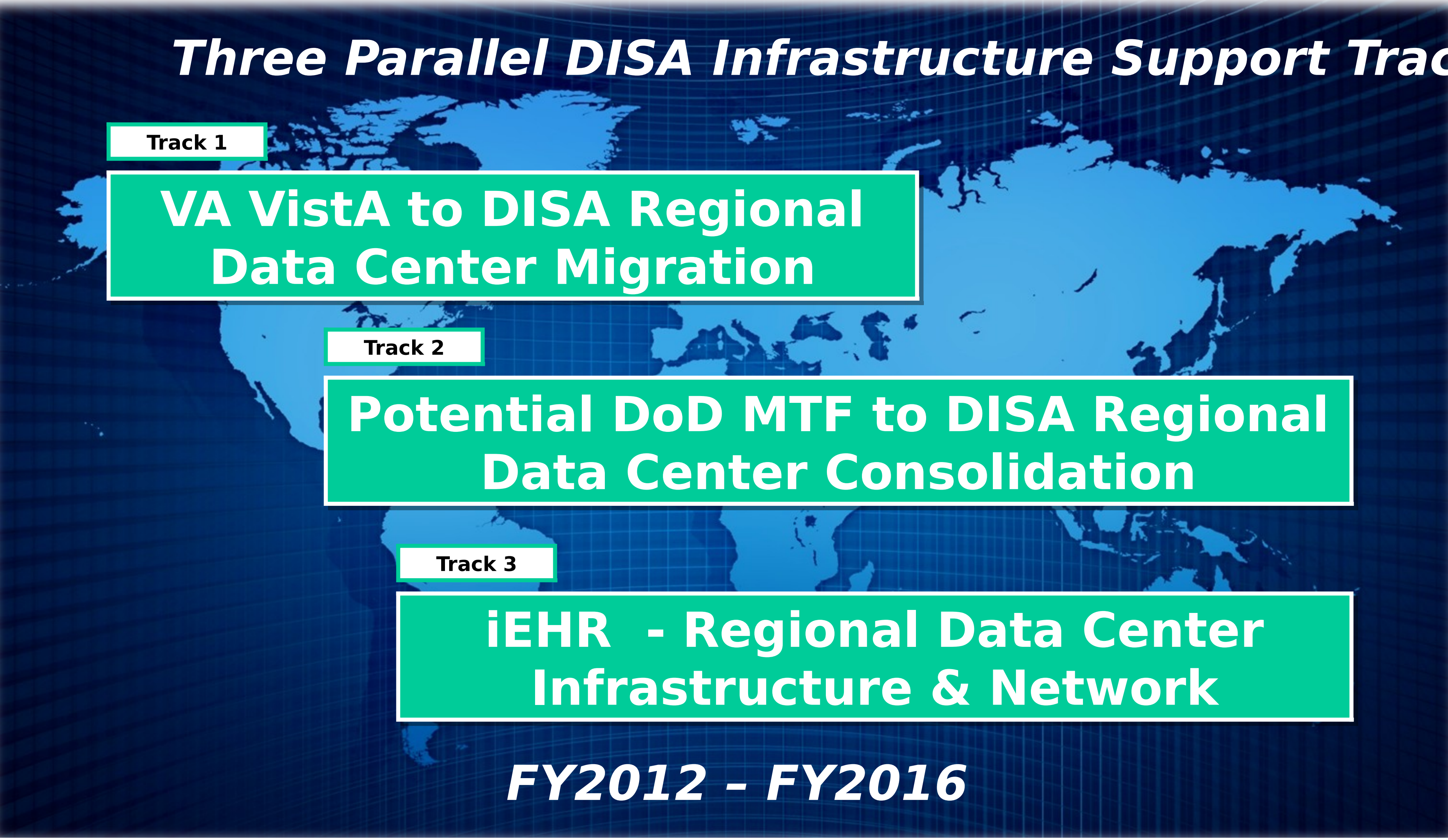
DECC Hosting for Global Broadcast System


Broadcast Segment
Space Segment
Receive Segment
1 SBM Operator
11 HelpDesk Operator
10 RSSC/GSSC/WSOC
DECC Oklahoma City
SBM Primary Site
15 SBM COOP Site
DECC Mechanicsburg, PA
2 Theater Information Managers
4 Defense Enterprise Computing Centers (DECC)
3 Sources
DISN WAN
5 UFO PIP
HW
SIG
Joint IP Modem (JIPM) Hub
6 Teleports
Joint IP Modem (JIPM) Hub
16 SBM Portal User
13 INMS
9 TMS
14 JDRS
UFO/Comm
WGS/Commercial
Joint IP Modem (JIPM) Remote Modem
Receive Terminal
12 RBM Laptop
RBM Operator
User LAN
7
8 RBM End User
User LAN

iNAVSEA Portal

- **NAVSEA is leveraging the NAVSEA/DISA/Microsoft partnership to implement the NAVSEA 2010 SharePoint Portal; iNAVSEA**
- **NAVSEA is migrating into the DOD Cloud to leverage the Active Directory (AD) capabilities.**
  - **Enterprise wide security; establish automated workflow processes for account creation; leverage Navy wide governance; Enterprise search capabilities**
- **Current Environments:**
  - **Production; Staging; COOP (Implementation phase)**
  - **Future growth expansion to 88,000 users**
- **Final Operational Capability (FOC) Environments:**
  - **Unclassified Navy Nuclear Propulsion Information (UNNPI); Classified/SIPRNet; Public (Internet)**
  - **Small Commands Environments;**
    - **Leverage similar iNAVSEA instances for collaboration within portal.**
    - **Migrate other Navy entities into the Portal Solution.**
  - **ExtraNet: Allows non-CAC users into the Port with limited access to accomplish analysis and research for the Navy.**
- **Schedule: Initial Operating Capability (IOC) – 17 Jan 2012**
  Final Operational Capability (FOC) – 17 Feb 2012

VA/DoD - iEHR Program Partnership



Three Parallel DISA Infrastructure Support Trac

Track 1

VA VistA to DISA Regional Data Center Migration

Track 2

Potential DoD MTF to DISA Regional Data Center Consolidation

Track 3

iEHR - Regional Data Center Infrastructure & Network

FY2012 – FY2016

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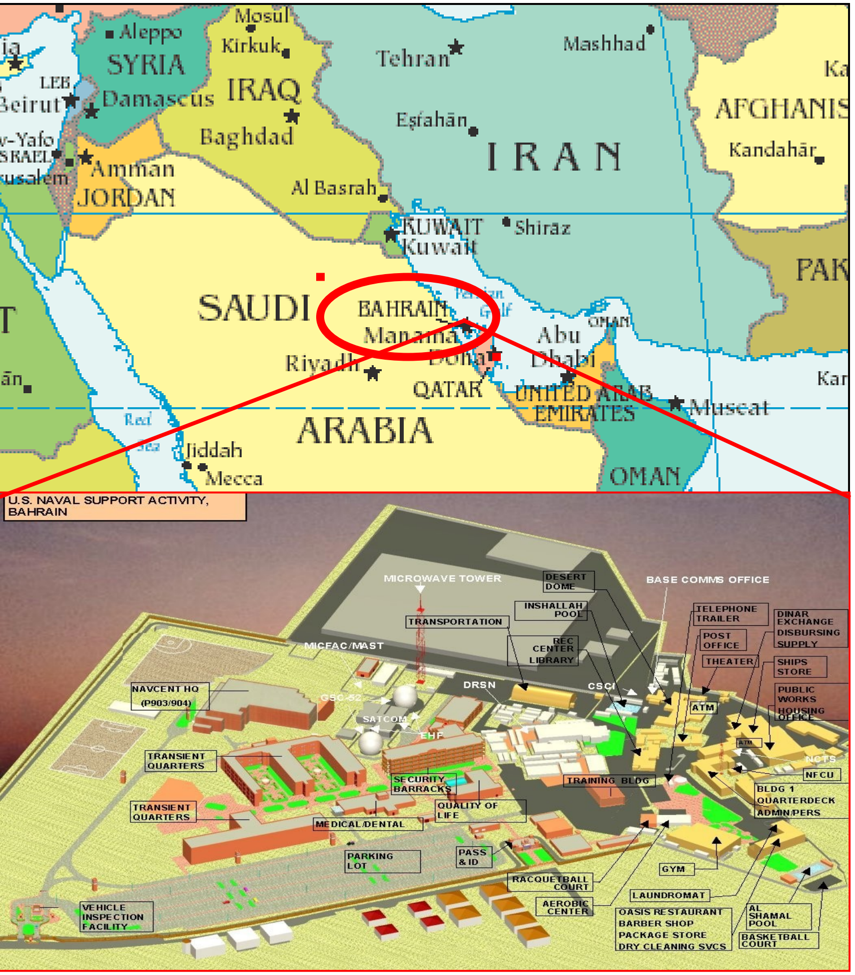
Theater Enterprise Computing Center (TECC)


Mosul
Aleppo
Kirkuk
SYRIA
Tehran
Mashhad
LEB
Beirut
Damascus
IRAQ
AFGHANIS
Esfahān
Baghdad
IRAN
Kandahār
Amman
JORDAN
Al Basrah
KUWAIT
Kuwait
Shiraz
PAK
SAUDI
BAHRAIN
Manama
Abu
Dhabi
OMAN
Riyadh
Doha
QATAR
UNITED ARAB EMIRATES
Muscat
Red Sea
Jiddah
ARABIA
Mecca
OMAN
U.S. NAVAL SUPPORT ACTIVITY, BAHRAIN
MICROWAVE TOWER
DESERT DOME
BASE COMMS OFFICE
INSHALLAH POOL
TRANSPORTATION
TELEPHONE TRAILER
DINAR EXCHANGE DISBURSING SUPPLY
MICFAC/MAST
REC CENTER LIBRARY
POST OFFICE
THEATER
SHIPS STORE
NAVCENT HQ (P903/904)
DRSN
CSCI
PUBLIC WORKS
HOUSING OFFICE
SATCOM
ATM
EHF
TRANSIENT QUARTERS
NCTS
NFCU
SECURITY BARRACKS
TRAINING BLDG
BLDG 1 QUARTERDECK ADMIN/PERS
TRANSIENT QUARTERS
QUALITY OF LIFE
MEDICAL/DENTAL
PARKING LOT
PASS & ID
GYM
RACQUETBALL COURT
LAUNDROMAT
AEROBIC CENTER
OASIS RESTAURANT
BARBER SHOP
PACKAGE STORE
DRY CLEANING SVCS
AL SHAMAL POOL
BASKETBALL COURT
VEHICLE INSPECTION FACILITY

DISA has established in partnership with CENTCOM their newest Computing Center

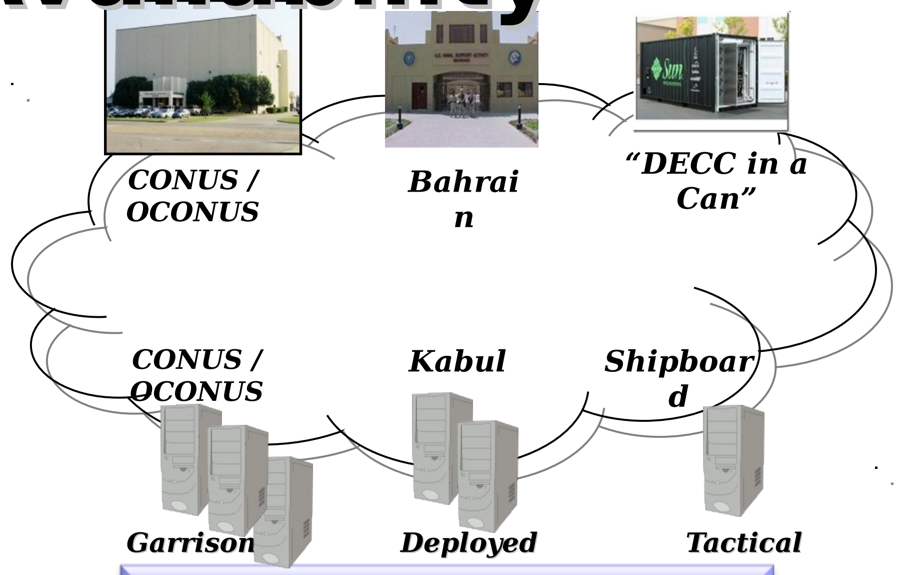
- ✓ **Located in Theater to deliver tactical functionality to the Warfighter**
- ✓ **Modernized facility with several infrastructure upgrades**
- ✓ **Uses the most recent computing technology designs and assets to maximize available floor space**
- ✓ **Leverages existing CSD application and database support and remediation systems**

Immediately available to provide Computing Services through DISA CSD COCOM Customer Management Team in partnership with

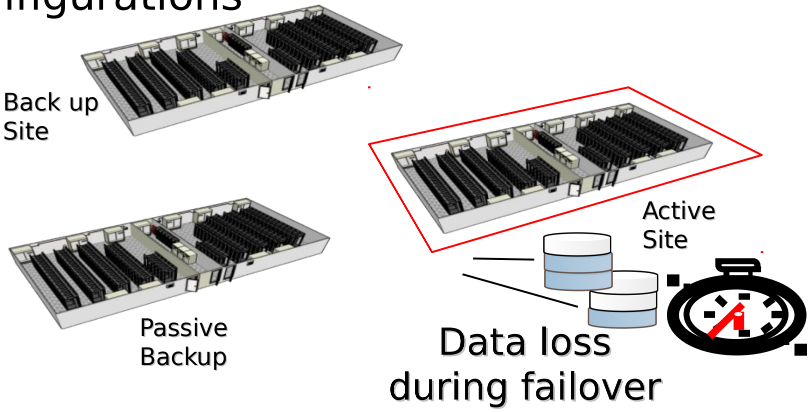
Future Computing Strategy

Enhanced Global Availability

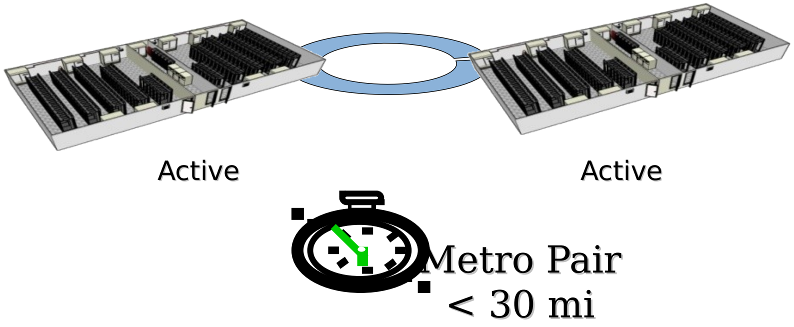
- Computing strategy going forward must focus on the view from the deployed end user:
  - Mobile “containers” for in-theater processing or reachback
  - Secure “mobile phone” like applets pushed from CONUS or OCONUS infrastructure
- To maintain optimum “always on” posture, need to **design infrastructure and applications** for increased mission assurance levels via active “hot” failover configurations


CONUS / OCONUS
Bahrain
“DECC in a Can”
CONUS / OCONUS
Kabul
Shipboard
Garrison
Deployed
Tactical

Extending from the Edge back


Back up Site
Active Site
Passive Backup
Data loss during failover

Current State: Passive Backup & Failover


Active
Active
Metro Pair < 30 mi

Target State: Synchronous Redundancy

SUMMARY

Cloud Hosting Foundation

Continue to drive brutal standardization across the DECCs to minimize heterogeneity across the platforms and applications

Extend current content delivery solutions (GCDS) to improve warfighter performance requirements beyond current implementations

Continue to field DoD enterprise services and solutions including: enterprise email, collaboration services, information sharing , etc.

Virtualization

Implement and optimize the virtual environment and communications infrastructure within the GIG to meet an “always on” design

Virtualize DoD hosted applications and storage beyond the current 44%. Maximize “on demand” technologies to improve performance capabilities

Built-in Resiliency and Redundancy

Architect the hosting infrastructure to ensure no individual component can impact operations – eliminate, as much as possible, any single points of failure

DEFENSE INFORMATION SYSTEMS AGENCY